IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF PENNSYLVANIA

PPG INDUSTRIES, INC., a Pennsylvania corporation, **Plaintiff,** **v.** **JIANGSU TIE MAO GLASS CO., LTD., a Chinese company; BENHUA WU, an individual; and MEI ZHANG, an individual.** **Defendants.**	**Case No.: 2-15-cv-00965-MRH**

DECLARATION OF KHUSHROO LAKDAWALA IN SUPPORT OF PLAINTIFF'S SUPPLEMENTAL MEMORANDUM IN SUPPORT OF ITS REQUEST FOR MONETARY DAMAGES

I, Khushroo Lakdawala, declare as follows:

1. I am an employee of Plaintiff PPG Industries, Inc. ("PPG") and have been so employed since 2006. My current job title is Global Director of Engineering and Technology, a position I have held since 2006. My responsibilities include, but are not limited to, managing design engineering, product support engineering, program management, materials, all coatings, and all research activities for transparencies. I make this declaration based on personal, firsthand knowledge, and if called and sworn as a witness, I could and would testify as set forth below.

2. I participated in the development of PPG's Opticor™ product over the life of its development and subsequent commercialization.

3. I reviewed (a) Brent Wright's May 21, 2019 *Declaration in Support of PPG's Motion for Default Judgment and Permanent Injunction* in this matter (dkt. 10-4), and (b) the cost accumulations I previously submitted in my May 20, 2019 declaration in this matter (dkt. 107-5).

The costs detailed in my May 20, 2019 declaration and herein are exclusively for the costs to create, develop, and commercialize PPG's proprietary transparency-related manufacturing processes identified in Mr. Wright's May 21, 2019 declaration (dkt. 107-4 at ¶ 4), and specifically with respect to PPG's confidential and proprietary process to manufacture a new type of commercial aircraft window ("Opticor™ Technology"). The precursor of Opticor™ was known as "NPT" before PPG used the Opticor™ brand name.

4. As a practice, PPG assigns each of its products a cost center and tracks the costs associated with the research and development of each product. The seven Opticor™ Technology cost centers relevant to PPG's damages calculation are: (1) NPT Base Polymer Development Opticor™ GBDC ("NPT Base Polymer Development"); (2) NPT Cabin Windows GBDC ("NPT Cabin Windows"); (3) NPT Ballistics GBDC ("NPT Ballistics"); (4) Opticor™ Sylmar; (5) Opticor™ for OEM Coatings at CIC ("Opticor™ for OEM Coating"); (6) Huntsville Development for Opticor™; and (7) Huntsville Engineering Hours for Opticor™ ("Huntsville Opticor™").

5. From 2006 through April 2015, NPT Ballistics spent $521,693.00, NPT Base Polymer Development spent $2,918,420.00, and NPT Cabin Windows spent 4,318,679.00 in research and develop costs for the Opticor™ Technology. These research and development costs include expenses for employee costs (*e.g.*, salary, employee health and insurance benefits, wages for temporary services, and business travel), operational costs (*e.g.*, equipment, lab materials, supplies, consultant fees, and inter-company services charges), and allocated general department costs (*e.g.*, overhead, depreciation of general property, and general administrative services) attributed exclusively to the research and development of the Opticor™ Technology in these cost centers. A true and correct copy of the line-item expenditure types and corresponding cost amounts for the NPT Ballistics, NPT Base Polymer Development, and NPT Cabin Windows cost centers

from 2006 through April 2015 is attached as Exhibit A. The line-item expenditure types and corresponding cost amounts in Exhibit A were derived from PPG accounting records of PPG's costs to research and develop Opticor™ and its precursor known as "NPT" before the Opticor™ brand name was applied at these cost centers. A true and correct copy of the narrative descriptions of each identified prime expense type, also derived from PPG's accounting records, is attached as Exhibit B.

6. Between 2008 and April 2015, Huntsville Development for Opticor™ and Opticor™ for OEM Coatings spent $182,834.30 and $76,313.00, respectively, in research and development costs for the Opticor™ Technology. The research and development expenditures for both Huntsville Development for Opticor™ and Opticor™ for OEM Coatings for this time period were recorded on a project-by-project basis, and in instances where the Opticor™ Technology did not account for the entirety of a project, Huntsville Development for Opticor™ was attributed a share of the expenditures exclusively attributable to the research and development of the Opticor™ Technology on that project. A true and correct copy of cost accumulations for Huntsville Development for Opticor™ and Opticor™ for OEM Coatings from 2008 through April 2015 is attached as Exhibit C. The project identifications, allocations, and corresponding cost amounts in Exhibit C were derived from PPG accounting reports for these cost centers.

7. PPG's accounting records also identified $784,842 in capital expenditures related to two machines PPG acquired to create and develop the Opticor™ Technology—*i.e.*, one Zwick Material Testing Machine ("Zwick Machine"), which cost $46,989, and one Max Machine, which cost $737,853. *See* Dkt. 107-5, Exhibit A. Both the Zwick Machine and Max Machine were predominately used for the initial creation and development of the Opticor™ Technology rather than ongoing manufacturing and production of Opticor™ products.

8. The Zwick Machine is a tensile testing machine—*i.e.*, a machine that is used to subject materials to a controlled tension until failure. PPG used the Zwick Machine to develop, evaluate, and refine the mechanical strength of Opticor™ materials. PPG purchased the Zwick Machine specifically to create and develop the Opticor™ Technology by using the machine to learn about and test, among other things, ultimate tensile strength, breaking strength, maximum elongation, and reduction area etc. of potential Opticor™ materials and configurations.

9. PPG invested in the Max Machine to develop the Opticor™ Technology. In so doing, PPG created proprietary designs and processes to configure and use the Max Machine as part of the Opticor™ Technology, including by: designing, creating, and developing proprietary molds for the Max Machine to produce Opticor™; researching and developing various mold orientations for the Max Machine to produce Opticor™; mitigating Opticor™ defects by researching and developing various delivery and fill rates for the Max Machine; researching and developing material resident time specifications for a Max Machine to produce Opticor™; and researching and developing hardware solutions (e.g., mix head specifications) to produce Opticor™ given the Max Machine's configuration and processor system requirements, etc.

10. PPG's proprietary designs, configurations, and processes related to the Max Machine for the Opticor™ Technology were included in the PPG proprietary report Thomas Rukavina provided to Defendants.

11. From 2012 through April 2015, the Opticor™ Sylmar cost center spent approximately $298,000 in research and development costs for the Opticor™ Technology as follows: $50,000 (2012); $40,000 (2013); $188,000 (2014); and $20,000 (2015). The cost amounts for 2012 through 2014 are rounded figures to the nearest thousand dollar and were derived from a PPG accounting report that tracked PPG's historical transparencies-related research and

development costs from 2001 through 2015 ("Historical R&D Spend Report"). With respect to the 2015 research and development costs, the Historical R&D Spend Report shows Opticor™ Sylmar spent $130,000 in developing the Opticor™ Technology that year. Based on my best conservative estimation of the allocation of resources in 2015, I attribute 15% (*i.e.*, ~$20,000) of the total costs in 2015 to the January through April 2015 time period.

12. In 2004 and 2005, the NPT Base Polymer cost center spent approximately $200,000 and $300,000, respectively, to research and develop the Opticor™ Technology. These figures are based on the Historical R&D Spend Report financial projection for PPG's transparencies-related business as a whole in 2004 and 2005 as well as the estimated percentage of work that would have been necessary to develop the Opticor™ Technology at that time. The cost amounts attributed to NPT Base Polymer for these two years represent less than 1% of PPG's transparencies-related business financial projections as a whole for each of those years.

13. From 2006 through 2014, Huntsville Opticor™ spent approximately 3,302.2 hours to research and develop the Opticor™ Technology at an average labor cost of $80.00 per hour. *See* Dkt. 107-5, Exhibit A.

14. For the time period between 2006 through 2011, I estimate that 2,900 hours spent at PPG's aerospace transparencies research and manufacturing facilities in Huntsville, Alabama, were attributable to the Huntsville Opticor™ cost center as follows: 400 hrs (2006); 800 hrs (2007); 600 hrs (2008); 500 hrs (2009); 300 hrs (2010); and 300 hrs (2011). For 2006, this estimate represents the work of 2 engineers that spent approximately 10% of their time (~4 hours per week) working to develop the Opticor™ Technology in 2006. For 2007, the estimated hours double primarily because the engineering team transitioned from initial research and development in 2006, to a qualification posture in 2007 which required more testing. The remainder of the estimates for

2008 through 2011 are based on my best recollection of the Opticor™ Technology engineering activities occurring at the time and my conservatively formed estimate regarding the amount of engineering hours dedicated to any milestone in any given year. In general, however, the hours consistently reflect an average of 2 or 3 engineers that dedicated 10% - 20% (4 to 8 hours per week) of their time developing the Opticor™ Technology as part of the Huntsville Opticor™ cost center. The 403.2 hours recorded from 2012 through 2014—*i.e.*, 287.0 (2012); 107.7 (2013); and 28.5 (2014)—were derived from the actual engineering hours attributed to the Huntsville Opticor™ cost center based on PPG's accounting records.

15. The average engineer who would have worked on the Opticor™ Technology between 2006 and 2014 would be a Senior Engineer, who generally would have earned a salary of at least $160,000 per year. In addition to the Senior Engineer's salary, PPG paid employee benefit costs of approximately 28% of the employee's salary, or ~$44,800 per year. With these two costs alone, excluding additional overhead costs, the average hourly rate for a Senior Engineer who would have been working on the Opticor Technology between 2006 and 2014 is approximately ~$98.46 per hour. Accordingly, I conservatively attribute an estimated cost of $80.00 per hour for engineering hours spent at Huntsville Opticor™.

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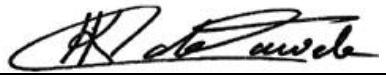
16. In 2006 and 2007, Huntsville Development for Opticor™ also spent approximately $10,000 and $20,000, respectively, in research and development costs for the Opticor™ Technology. These estimates are based on my best recollection and informed estimation of what Huntsville Development would have spent to research and develop the Opticor™ Technology at that time.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Executed on 21 day of August , 2020, in Sylmar, California.

By: 

Khushroo Lakdawala

NPT Ballistics GBDC		
Prime Account	**Prime Expense Description**	**2009**
5410	Salaries	$ 148,192
5481	Employee Benefits (i.e., pension costs, group life insurance)	$ 34,061
5412	Temporary Services	$ 34,709
5413	Travel	$ 381
5435	Equipment And Supplies	$ 6,334
5465	Lab Materials & Supplies	$ 61,319
5442	Maint Materials And Supplies	$ 1,784
5423	Professional Services	$ 4,629
5470, 5496	Service Charges/Credits (costs/income charged to other PPG units)	$ 22,280
5470	Service Charge - Analytical Tests	$ 8,434
6470	General Administration	$ (68,111)
Allocation	Overhead Allocation	$ 267,681
	Total:	$ 521,693

Exhibit A

NPT Base Polymer Development Opticor GBDC						
Prime Account	**Prime Expense Description**	**2011**	**2012**	**2013**	**2014**	**2015**
5410	Salaries	$ 147,297	$ 164,262.11	$ 185,228.99	$ 152,879.03	$ 31,090.85
5410	Employee Benefits (i.e., pension costs, group life insurance)	$ 36,603	$ 48,178.62	$ 45,422.71	$ 38,983.81	$ 8,394.53
5412	Temporary Services	$ 37,936	$ 26,469.25	$ 70,318.37	$ 64,217.11	$ 17,634.45
5419	Travel	$ 6,077	$ 5,622.61	$ 9,355.53	$ 8,524.12	$ 1,454.44
5435	Equipment And Supplies	$ 3,813	$ 3,787.66	$ 29,687.11	$ 62,129.55	$ (8,125.00)
5465	Lab Materials & Supplies	$ 24,997	$ 41,644.48	$ 32,945.50	$ 43,894.08	$ 11,126.16
5442	Maint Materials And Supplies	$ 6,100	$ 573.13	$ 20.04	$ 680.00	$ 1,235.24
5412	Maintanence Temp. Grubb & Ellis	$ -	$ 6,236.50	$ -	$ -	$ -
5435	Computer Supplies And Non-Capital Equip.	$ 237	$ 2,738.99	$ -	$ -	$ -
5423	Professional Services	$ 27,624	$ 26,538.00	$ 28,273.15	$ 11,646.47	$ 40,261.00
5470, 5496	Service Charges/Credits (costs/income charged to other PPG units)	$ 16,603	$ 6,078.99	$ 1,900.08	$ 2,185.57	$ 365.07
5470, 5496	Service Charges/Credits (costs/income charged to other PPG units)	$ -	$ -	$ 800.00	$ 160.00	$ -
5470, 5496	Service Charges/Credits (maintenance)	$ -	$ -	$ 4,668.09	$ 1,758.50	$ 947.38
5426	Mail Service / Postage	$ -	$ -	$ 147.47	$ 267.11	$ 103.26
5470	Service Charge - Analytical Tests	$ 15,677	$ 12,762.91	$ 14,518.36	$ 9,987.00	$ 2,732.00
Allocation	Overhead Allocation	$ 222,470	$ 313,501.46	$ 360,391.42	$ 335,054.13	$ 91,329.00
	Total:	$ 545,434	$ 658,394.71	$ 783,676.82	$ 732,366.48	$ 198,548.38

Grand Total: $ 2,918,420

Exhibit A

NPT Cabin Windows GBDC						
Prime Account	**Prime Expense Description**	**2006**	**2007**	**2008**	**2009**	**2010**
5410	Salaries	$ 122,819	$ 290,101	$ 294,806	$ 165,699	$ 131,050
5410	Shop Labor	$ 5,445	$ 19,237	$ 6,643	$ -	$ -
5481	Employee Benefits (i.e., pension costs, group life insurance)	$ 32,835	$ 87,091	$ 76,501	$ 38,885	$ 31,253
5412	Temporary Services	$ 4,160	$ 12,877	$ 105,991	$ 17,871	$ 39,322
5413	Travel	$ 3,772	$ 24,761	$ 12,199	$ 1,182	$ 529
5419	Training/Travel	$ -	$ -	$ 4,000	$ -	$ -
5435	Equipment And Supplies	$ 1,682	$ 2,015	$ 54,804	$ 17,337	$ 8,395
5465	Lab Materials & Supplies	$ 72,087	$ 243,040	$ 146,171	$ 60,188	$ 32,928
5442	Maint Materials And Supplies	$ 2,845	$ 24,098	$ 55,585	$ 12,915	$ 1,624
5412	Maintanence Temp. Grubb & Ellis	$ 3,342	$ 3,345	$ 830	$ -	$ -
5435	Computer Supplies And Non-Capital Equip.	$ 74	$ 972	$ 6,846	$ -	$ 1,727
5423	Professional Services	$ 4,760	$ 25,831	$ 17,392	$ 3,643	$ 301
5436	Depreciation	$ -	$ -	$ 3,390	$ 10,170	$ 9,323
5470, 5496	Service Charges/Credits (costs/income charged to other PPG units)	$ 8,085	$ 76,024	$ 48,877	$ 80,371	$ 17,478
5470, 5496	Service Charges/Credits (costs/income charged to other PPG units)	$ (2,380)	$ 2,946	$ (85,630)	$ 28,982	$ -
5470	Service Charge - Analytical Tests	$ 13,804	$ 48,815	$ 28,598	$ 9,697	$ 18,224
6436	Depreciation	$ 10,541	$ 26,666	$ 43,018	$ -	$ -
6470	General Administration	$ 55,771	$ 155,365	$ 163,783	$ (84,388)	$ -
Allocation	Overhead Allocation	$ 146,455	$ 240,809	$ 371,586	$ 331,652	$ 204,585
Allocation	Overhead Depreciation	$ -	$ -	$ 2,256	$ -	$ -
	Total:	$ 486,097	$ 1,283,993	$ 1,357,646	$ 694,204	$ 496,739

Grand Total: $ 4,318,679

Exhibit A

Prime Account	Prime Description	Prime Notes
5410	Salaries And Wages	This account is used to record the gross payroll for employees in research and engineering development.
5412	Temporary Services	This account is used to record the fees paid to outside agencies for furnishing temporary help to meet research and engineering development personnel requirements. The fees consist of two elements (1) wages to the temporary help and (2) an administrative charge by the agency.
5413	Expenses Of Employees	This account is used to record the expenses incurred for travel, business meals, entertainment, seminar fees and business meetings by Company personnel serving the Company in the research and engineering development organization.
5419	Training Expense	This account is used to record the expense of Company personnel to attend outside training courses (including registration, seminar fees and travel expenses) as well as costs incurred to conduct in-house seminars.
5423	Professional Services	This account is used to record the fees paid for services rendered by outside consultants and other professional firms, including employment agencies placement fees. Include expenses incurred by these individuals and firms, which are billed separately from basic fees.
5426	Mail Services, Postage And Freight	This account is used to record the freight and postage expense incident to research and development activities together with the cost of any external courier or delivery services.
5435	Other Equipment Costs	This account is used to record the cost of other equipment not capitalized which is utilized in the research and engineering development function.
5436	Depreciation	This account is used to record the periodic depreciation of the capitalized cost of property utilized in the research and engineering development function.
5442	Maintenance	This account is used to record maintenance expenditures incurred to preserve facilities or equipment, utilized by the research and engineering development organization, in a normal state of efficiency or good condition. Maintenance agreement charges for office machines and other types of equipment are recorded herein.
5465	Laboratory Materials And Supplies	This account is used to record the cost of laboratory materials and supplies purchased by the research and engineering development organization.
5470	Service Charges	This account is used to record the amounts billed to the research and engineering development organization for charges incurred by another unit within the PPG consolidation.
5481	Employee Benefit Expense	This account is used to record the items of employee benefit expense related to the research and engineering development organization (i.e., group life insurance, pension costs, etc.).
5496	Service Credits	This account is used to record the research and engineering development organization charges billed to other units within the PPG consolidation.
6436	Depreciation	This account is used to record the periodic depreciation of the capitalized cost of property utilized in the general and administrative function.
6470	Service Charges	This account is used to record the billed amounts of general administrative expenses incurred by another unit within the PPG consolidation.

Exhibit B

Huntsville Development for Opticor				
Year	Project No.	Total Cost	Opticor %	Opticor R&D Cost
2008	WD9789	$ 125,768.25	20%	$ 25,153.65
2009	WD9789	$ 238,186.31	20%	$ 47,637.26
2010	WD9789	$ 26,054.30	10%	$ 2,605.43
2010	WD9875	$ 27,550.36	20%	$ 5,510.07
2011	WD9930	$ 1,216.16	100%	$ 1,216.16
2011	WD9875	$ 26,711.77	20%	$ 5,342.35
2012	WD9965	$ 420.00	100%	$ 420.00
2012	WD9966	$ 6,460.24	100%	$ 6,460.24
2012	WD9875	$ 19,854.63	20%	$ 3,970.93
2013	WD9965	$ 13,969.08	100%	$ 13,969.08
2014	WD9789	$ 232,203.18	10%	$ 23,220.32
2015	WD9966	$ 6,460.24	100%	$ 6,460.24
2015	WD9789	$ 228,403.18	10%	$ 22,840.32
2015	WD9875	$ 83,374.21	10%	$ 8,337.42
2015	WD9940	$ 323,027.66	3%	$ 9,690.83
			Total:	$ 182,834.30

Opticor for OEM Coatings at CIC		
Year	Project	Total Cost
2014	Opticor Coating for OEM	$ 2,015.00
2015	Opticor Coating for OEM	$ 74,298.00
	Total:	$ 76,313

Exhibit C